Having thus described the invention, we claim:

1. A method for removing acid gases from a light hydrocarbon gas feed stream to each of a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) providing a plurality of light hydrocarbon gas acid gas removal vessels, each of the vessels containing an aqueous amine and being adapted to remove acid gas from a light hydrocarbon gas feed stream to a light hydrocarbon gas liquefaction train;

b) passing a first light hydrocarbon gas feed stream through a first light hydrocarbon gas acid gas removal vessel to produce a light hydrocarbon gas feed stream having a reduced acid gas content for a first light hydrocarbon gas liquefaction train;

c) passing a second light hydrocarbon gas feed stream through a second light hydrocarbon gas acid gas removal vessel to produce a second light hydrocarbon gas feed stream having a reduced acid gas content for a second light hydrocarbon gas liquefaction train; and

d) regenerating a spent aqueous amine from the acid gas removal vessels and returning regenerated aqueous amine to the acid gas removal vessels.

2. The method of claim 1 wherein the aqueous amine comprises an amine selected from the group consisting of diglycolanolamine, methyldiethanolamine, methylethylanolamine, SULFINOL and combinations thereof.

3. A method for removing water from a light hydrocarbon gas feedstream to each of a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) providing a plurality of light hydrocarbon gas dewatering molecular sieve vessels, each of the vessels being adapted to dewater a light hydrocarbon gas feed stream to a light hydrocarbon gas liquefaction train;

b) passing a first light hydrocarbon gas feed stream through a first light hydrocarbon gas dewatering vessel to produce a first dewatered light hydrocarbon gas feed stream for a first light hydrocarbon gas liquefaction train;

c) passing a second light hydrocarbon gas feed stream through a second light hydrocarbon gas dewatering molecular sieve vessel to produce a second dewatered light hydrocarbon gas feed stream for a second light hydrocarbon gas liquefaction train;

d) switching the first light hydrocarbon gas stream from the first light hydrocarbon gas dewatering molecular sieve vessel when the first light hydrocarbon gas dewatering vessel is spent and passing the first light hydrocarbon gas stream through another of the plurality of light hydrocarbon gas dewatering vessels to produce the first dewatered light hydrocarbon gas feed stream for the first light hydrocarbon gas liquefaction train; and,

e) regenerating the first spent light hydrocarbon gas dewatering molecular sieve vessel for re-use to dewater a light hydrocarbon gas stream.

4. The method of claim 3 wherein the number of light hydrocarbon gas dewatering vessels is a whole number which is less than or equal to the average run time of the light hydrocarbon gas vessels for dewatering divided by the regeneration

time for a light hydrocarbon gas dewatering molecular sieve vessel plus one or a whole number of multiples of the number.

5. The method of claim 3 wherein the light hydrocarbon gas dewatering molecular sieve vessels contain a molecular sieve or activated alumina.

6. The method of claim 3 wherein the spent vessel is thermally regenerated.

7. A method for removing acid gas and dewatering a light hydrocarbon gas feed stream to each of a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) providing a plurality of light hydrocarbon gas acid gas removal vessels, each of the vessels containing an aqueous amine and being adapted to remove acid gas from a light hydrocarbon gas feed stream to a light hydrocarbon gas liquefaction train;

b) passing a first light hydrocarbon gas feed stream through a first light hydrocarbon gas acid gas removal vessel to produce a first light hydrocarbon gas feed stream having a reduced acid gas content for a first light hydrocarbon gas liquefaction train;

c) passing a second light hydrocarbon gas feed stream through a second light hydrocarbon gas acid gas removal vessel to produce a second light hydrocarbon gas feed stream having a reduced acid gas content for a second light hydrocarbon gas liquefaction train;

d) regenerating a spent aqueous amine from the acid gas removal vessels and returning regenerated aqueous amine to the acid gas removal vessels.

e) providing a plurality of light hydrocarbon gas dewatering molecular sieve vessels, each of the vessels being adapted to dewater a light hydrocarbon gas feed stream to a light hydrocarbon gas liquefaction train;

f) passing a first light hydrocarbon gas feed stream having a reduced acid gas content through a first light hydrocarbon gas dewatering molecular sieve vessel to produce a first dewatered light hydrocarbon gas feed stream having a reduced acid gas content for a first light hydrocarbon gas liquefaction train;

g) passing a second light hydrocarbon gas feed stream having a reduced acid gas content through a second light hydrocarbon gas dewatering molecular sieve vessel to produce a second dewatered light hydrocarbon gas feed stream having a reduced acid gas content for a second light hydrocarbon gas liquefaction train;

h) switching the first light hydrocarbon gas stream from the first light hydrocarbon gas dewatering molecular sieve vessel when the first light hydrocarbon gas dewatering molecular sieve vessel is spent and passing the first light hydrocarbon gas stream through another of the plurality of light hydrocarbon gas dewatering molecular sieve vessels to produce a first light hydrocarbon gas feed stream having a reduced acid gas content and a reduced water content for the first light hydrocarbon gas liquefaction train; and,

i) regenerating the first spent light hydrocarbon gas dewatering molecular sieve vessel for re-use to dewater a light hydrocarbon gas stream.

8. The method of claim 7 wherein the aqueous amine comprises an amine selected from the group consisting of diglycolanolamine, methyldiethanolamine, methylethylanolamine, sulfinol and combinations thereof.

9. The method of claim 7 wherein the light hydrocarbon gas dewatering molecular sieve vessels contain a molecular sieve or activated alumina.

10. The method of claim 7 wherein the spent dewatering vessels are thermally regenerated.

11. A system for dewatering a light hydrocarbon gas feed stream to each of a plurality of light hydrocarbon gas liquefaction trains, the system comprising:

a) a plurality of molecular siéve dewatering vessels, each of the vessels having a gas inlet and a gas outlet so that an inlet gas can be charged to each dewatering vessel and a dewatered gas recovered from each dewatering vessel;

b) a light hydrocarbon gas supply line in fluid communication with each gas inlet;

c) a dewatered light hydrocarbon gas recovery line in fluid communication with each gas outlet line; and,

d) a regeneration gas outlet line in fluid communication with each dewatering vessel so that each dewatering vessel can be thermally regenerated.

12. The system of claim 11 wherein the number of dewatering vessels is less than or equal to an average run time for each of the dewatering vessels in dewatering service divided by the average regeneration time for each of the dewatering vessels plus one or whole number multiples thereof.

13. A system for removing acid gases and dewatering a light hydrocarbon gas feed stream to each of a plurality of light hydrocarbon gas liquefaction trains, the system comprising:

a) a plurality of aqueous amine acid gas removal vessels, each of the vessels having a gas inlet and a reduced acid gas outlet so that an inlet gas can be charged to each acid gas removal vessel and a gas having a reduced acid gas content can be recovered from each acid gas removal vessel;

b) a gas supply line in fluid communication with each gas inlet;

c) a gas recovery line in fluid communication with each reduced acid gas outlet;

d) an aqueous amine regenerator having a spent amine inlet and a regenerated aqueous amine outlet;

e) a regenerated aqueous amine inlet in fluid communication with the regenerated aqueous amine outlet and each acid gas removal vessel;

f) a spent aqueous amine outlet in fluid communication with the spent aqueous amine inlet and each acid gas removal vessel; and,

g) a plurality of molecular sieve dewatering vessels, each of the dewatering vessels having a reduced acid gas inlet and a gas outlet so that a reduced acid gas inlet gas from an acid gas removal vessel can be charged to each dewatering vessel and a dewatered gas recovered from each dewatering vessel;

h) a gas supply line in fluid communication with at least one reduced acid gas outlet;

i) a dewatered gas recovery line in fluid communication with each dewatered gas outlet line and;

j) a regeneration outlet line in fluid communication with each dewatered vessel so that each dewatering vessel can be thermally regenerated.

14. A system for removing acid gases from a light hydrocarbon gas feed stream to each of a plurality of light hydrocarbon gas liquefaction trains, the system comprising:

a) a plurality of aqueous amine acid gas removal vessels, each of the vessels having a gas inlet and a reduced acid gas outlet so that an inlet gas can be charged to each acid gas removal vessel and a gas having a reduced acid content can be recovered from each acid gas removal vessel;

b) a gas supply line in fluid communication with each gas inlet;

c) a treated gas recovery line in fluid communication with each gas outlet;

d) a regenerated aqueous amine inlet to each acid gas removal vessel;

e) a spent aqueous amine outlet from each acid gas removal vessel; and,

f) a spent aqueous amine regenerator in fluid communication with at least one selected regenerated aqueous amine inlet and with at least one selected spent aqueous amine outlet.

15. A method for efficiently and economically constructing a light hydrocarbon gas liquefaction process for the liquefaction of selected quantities of light hydrocarbon gas in a first light hydrocarbon gas liquefaction train and up to a selected maximum quantity of light hydrocarbon gas using a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) constructing a first light hydrocarbon gas liquefaction process train for the liquefaction of a first selected quantity of light hydrocarbon gas including facilities for

light hydrocarbon gas pretreatment to remove acid gases and water, refrigerant compression, access services, light hydrocarbon gas liquefaction, and liquefied light hydrocarbon gas product storage and shipping;

b) positioning at least a portion of the facilities in the first train for shared use by the first train and subsequent trains;

c) constructing at least a portion of the first train facilities for shared use for modular expansion, as required by the addition of subsequent trains, up to the maximum capacity required to liquefy the selected maximum quantity of light hydrocarbon gas or initially designing the portion of the first train facilities for shared use of a size sufficient to liquefy the selected maximum quantity of light hydrocarbon gas.

d) constructing additional trains as required to liquefy a second selected quantity of light hydrocarbon gas;

e) providing at least a portion of the facilities in the additional trains by shared use of the shared use facilities in the first train as constructed in the first train or as constructed in the first train and expanded to the required capacity;

f) processing light hydrocarbon gas for the first train and the additional trains in at least a portion of the shared facilities; and

g) liquefying the second selected quantity of light hydrocarbon gas to produce liquefied light hydrocarbon gas product.

16. A method for designing an efficient and economical light hydrocarbon gas liquefaction process for the liquefaction of selected quantities of light hydrocarbon gas in a first light hydrocarbon gas liquefaction train and up to a selected maximum

quantity of light hydrocarbon gas using a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) designing a first light hydrocarbon gas liquefaction process train including facilities for light hydrocarbon gas pretreatment to remove acid gases and water, refrigerant compression, access services, light hydrocarbon gas liquefaction, and liquefied light hydrocarbon gas product storage and shipping;

b) designing at least a portion of the facilities in the first train for shared use with by the first train and subsequent trains;

c) designing at least a portion of the first train facilities for shared use for modular expansion, as required by the addition of subsequent trains, up to the maximum capacity required to liquefy the maximum quantity of light hydrocarbon gas or initially designing the portion of the first train facilities for shared use of a size sufficient to liquefy the maximum quantity of light hydrocarbon gas.

17. A method for efficiently and economically constructing a light hydrocarbon gas liquefaction process for the liquefaction of selected quantities of light hydrocarbon gas in a first light hydrocarbon gas liquefaction train up to a selected maximum quantity of light hydrocarbon gas using a plurality of light hydrocarbon gas liquefaction trains, the method comprising:

a) constructing a first light hydrocarbon gas liquefaction process train for the liquefaction of a first selected quantity of light hydrocarbon gas including facilities for light hydrocarbon gas pretreatment to remove acid gases and water, refrigerant compression, access services, light hydrocarbon gas liquefaction, and liquefied light hydrocarbon gas product storage and shipping;

b) positioning at least a portion of the facilities in the first train for shared use by the first train subsequent trains;

c) constructing at least a portion of the first train facilities for shared use for modular expansion as required by the addition of subsequent trains up to the maximum capacity required to liquefy the maximum quantity of light hydrocarbon gas or initially constructing the portion of the first train facilities for shared use of a size sufficient to liquefy the maximum quantity of liquefied light hydrocarbon gas.

d) constructing additional trains as required to liquefy a second selected quantity of light hydrocarbon gas; and,

e) providing at least a portion of the facilities in the additional trains by shared use of the shared use facilities in the first train as constructed in the first train or as constructed in the first train and expanded to the required capacity.